E-ISSN: 2614-5219

CASE REPORT

Histopathological Feature On Chronic Or Delayed Progression Epidural Hematoma

Feda Anisah Makkiyah

Universitas Pembangunan Nasional "Veteran" Jakarta, Indonesia

Email: fedaanisah@upnvj.ac.id

Abstract: *The incidence of chronic epidural haematoma (CEDH) is uncommon. The exact definition of the time and the guideline is not established until now. Meanwhile, there is also another entity, delayed progression of epidural hematoma (DEDH), which is also a rare condition and some authors included it as CEDH.* ***Method:*** *We present a case report here of a patient with no initial imaging taken, because of minimal symptoms. Because the persistence of headache, after one month, head CT scan was performed, and patient underwent craniotomy evacuation procedure. There was pathologic examination to differentiate diagnosis.* ***Results:*** *The pathological view showed that there was fibrotic tissue, blood vessels, multinucleated giant cells, hemosiderophages, lymphocytes, chronic inflammation cell, small to medium sized blood vessels and trabeculae of bone.* ***Conclusion****: The definite diagnosis will be established by the histopathology. Here, we present a CEDH case with the histopathology result. The support of histopathology generates clear images of the entity.*

Keywords: *CEDH, DEDH, histopathology view*

BACKGROUND

Most epidural hematomas occur in acute settings. The cause of bleeding in epidural spaces is torn middle meningeal artery or venous bleeding following the laceration of a dural venous sinus. The prevalence is 2% from traumatic brain injury.[1] In a study that collected 115 samples, 83 % was acute, and the rest, 17%, was chronic epidural hematoma (more than 72 h from the accident to diagnosis) (CEDH).[2] There was a study that defined the epidural hematoma based on radiologic appearance, acute, subacute, and chronic (more than 7 to 20 days with mixed density or lucent appearance with contrast enhancement.[1] Another study mentioned the incidence of

E-ISSN: 2614-5219

chronic epidural hematoma (CEDH) is uncommon; however, in the last two decades, several literatures mentioned the case reports of CEDH.[3] Another study also reported the incidence of CEDH 3.9 to 30% of all EDHs.[4]

Regarding the delayed progression of epidural hematoma (DEDH), it is a rare condition, and some authors included it as in CEDH, even though it has a different and distinct entity. DEDH is not apparent in the initial imaging and progresses later on with developed symptoms. The postulated reason was the removal effect of tamponading and the resulting hematoma presented after the treatment of hypovolemic shock.[5]

Until now, no consensus defines the exact period of chronic epidural hematoma and how to differentiate between CEDH and DEDH. We present a case report of a patient with no initial imaging taken because of minimal symptoms. The debate on whether this entity was considered CEDH or DEDH was presented with arguments from a histopathology point of view. We scrutinize this entity based on different perspectives in hoping of acknowledging the clear picture of the entity.

CASE REPORT

A 17-year-old male fall from second story of his house. He had several time vomit and nausea. He was brought to emergency department and because he felt better after several hours in emergency, he went home. He had no initial imaging. He continuously felt headache over one month, but the pain came and decreased over the day. Because he felt that his constant headache hindered in his activity, he went to the hospital to get CT scan.

He had previous health history; he had finished his tuberculosis treatment in five months ago. His doctor said that he was cured from his tuberculosis. His physical examination was remarkably in good condition, only headache that made him in restricted activities. He denied any neurological deficits, any memory loss or any behavioral issues. His laboratory values were within normal limit.

His CT scan showed large hyperdense areas (suggestive large epidural hematoma) over his left

E-ISSN: 2614-5219

parietal region, sulci and gyri are compressed over that region. His bone window CT scan showed linier appearance in his parietal bone (Figure 1). He was consulted to neurosurgeon and craniotomy extradural hematoma removal was performed the next morning. Intraoperative findings showed that there was thick clot and no calcification visible, the source of bleeding was the bleeding from the venous diploe.

The pathological view showed that there was fibrotic tissue, blood vessels, multinucleated giant cells, hemosiderophages, lymphocytes, chronic inflammation cell, small to medium sized blood vessels and trabeculae of bone (Figure 2).

The patient relieved from the headache after the operation and CT scan 2 months post operation demonstrated complete resolution of the parietal mass.

DISCUSSION

Chronic EDH is a rare condition. Literature mentions the incidence is 4-20% from EDH incidence.[6] It is characterized by slow progression of the symptoms. The symptoms starts 48-72 hours and no more than 13 days after the injury.[6] The definite diagnosed was performed by contrast head-CT. The appearance of peripheral enhancement in the clot was due to the existence of granulated tissue and increase of new vessels.[7] The pathophysiology of DEDH was still debatable. The last hypothesis were reduction of ICP and increased cerebral blood flow by administration of mannitol or post shock hypovolemic treatment.[6] The patient first imaging usually shows normal imaging or another different pathology. The symptoms start more progressive than CEDH.

Our patient showed slow progression of the disease and the symptoms started from the early day, and based on the timeline of chronic EDH, this patient is considered CEDH (8). Our current case had no initial imaging, the CT scan one month after trauma shows hyperdense appearance over the left parietal region. Intraoperative findings show the thick clot over the parietal duramater with overlying fracture. All these facts were supported the CEDH.

E-ISSN: 2614-5219

The pathology report indicates that the chronic inflammation process has ended and there is no membrane present over the hematoma cavity when viewed under a microscope. The presence of this membrane is considered an important diagnostic point for chronic epidural hematoma (CEDH), as demonstrated in a case report of a 9-year-old boy who experienced minor trauma and had a membrane consisting of granulation tissue with fibroblasts and histiocytes overlying the hematoma cavity (according to the histopathology result). There was evidence of various degrees of degradation of fresh erythrocytes. The boy reported only a history of minor trauma.[5]

Regarding giant cell found in our current case, is a collection of cells of histiocytes and performed a mass.[9] There are various type of multinucleated giant cells, such as tuberculoid granulomas, osteoclasts, and foreign body giant cells.[1,10] In certain situations, monocytes can merge together to create a multinucleated giant cell. However, as far as the author knows, there is no literature that discusses multinucleated giant cells (MGCs) in CEDH. This revelation calls for further research. Additionally, it should be noted that in the case of this patient who had tuberculosis, the MGCs were not Langhans MGCs which are specific to tuberculosis.

The macrophages break down red blood cells into an iron-storage complex called hemosiderin, resulting in the creation of hemosiderophages.[11] This is consistent with a study that found chronic subdural hematoma (SUDAH) appears as a hypointense collection of hemosiderin in T2W images on MRI.[12] In the chronic stage, it is a fact that RBCs cease to exist, leaving only hemosiderin collections in their wake. Simultaneously, neoangiogenesis takes place, as discovered by another study.[13] Neovascularization in CEDH has been confirmed through our microscopic analysis, which has identified the presence of small to medium-sized blood vessels.[14]

E-ISSN: 2614-5219

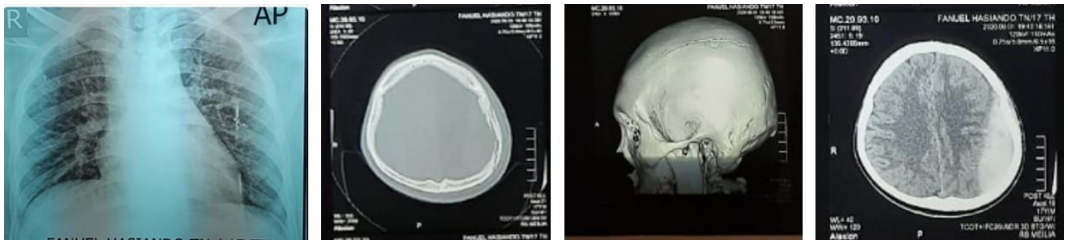

Figure 1. The head CT scan of chronic epidural hematoma of a 17 th year old male. His CT scan shows large hyperdense areas (suggestive large epidural hematoma) over his left parietal region, sulci and gyri were compressed over that region. His bone window CT scan showed linier appearance in his parietal bone.

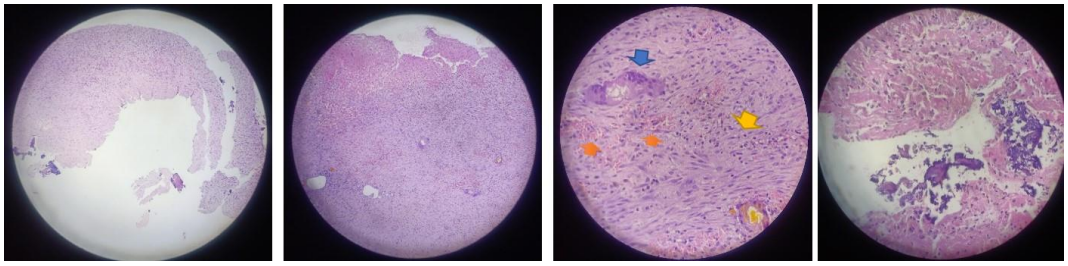

Figure 2. The histopathology imaging of chronic epidural hematoma of a 17 th year old male. The photomicrograph view shows that there was fibrotic tissue, blood vessels, multinucleated giant cells (blue arrow), hemosiderophages, lymphocytes (yellow arrow), chronic inflammation cell, small to medium sized blood vessels (orange arrows) and trabeculae of bone (H & E, 100x, 400x).

CONCLUSION

The definite diagnosis will be established by the histopathology and supportive imaging. Here, we present a CEDH case with the histopathology result. The support of histopathology gives clear images of the entity.

ACKNOWLEDGEMENT

The authors declare no financial support of funding from external sources. FAM, R gathered the data and RHN wrote the article.

E-ISSN: 2614-5219

REFERENCE

1. Khairat A, Waseem M. Epidural hematoma. In: StatPearls [Internet]. StatPearls Publishing; 2022.
2. Kihara K, Sato M, Kado K, Fukuda K, Nakamura T, Yamakami I. A case of acute intracranial epidural hematoma caused by chronic nasal sinusitis. No Shinkei Geka. 2015;43(1):69–74.
3. Bonilha L, Mattos JPV, Borges WAA, Fernandes YB, Andrioli MS, Borges G. Chronic epidural hematoma of the vertex. Clin Neurol Neurosurg. 2003;106(1):70–4.
4. Banga MS, Sandeep B, Dixit S. Chronic epidural hematoma: still a rare entity? Indian J Neurotrauma. 2022;19(01):023–8.
5. Basamh M, Robert A, Lamoureux J, Saluja RS, Marcoux J. Epidural hematoma treated conservatively: when to expect the worst. Can J Neurol Sci. 2016;43(1):74–81.
6. Umana GE, Cristaudo C, Scalia G, Passanisi M, Corsale G, Tomarchio L, et al. Chronic epidural hematoma caused by traumatic intracranial pseudoaneurysm of the middle meningeal artery: review of the literature with a focus on this unique entity. World Neurosurg. 2020;136:198–204.
7. Goyal S. Neuroradiology: A Case-based Guide. CRC Press; 2020.
8. Makkiyah F, Sadewo W. Good Recovery after Delayed Surgery of Large Epidural Hematoma with Falcine Herniation. 2019;
9. Mohan H. Pathology practical book. JP Medical Ltd; 2012.
10. Matsui H, Imagama S, Ito Z, Ando K, Hirano K, Tauchi R, et al. Chronic spontaneous lumbar epidural hematoma simulating extradural spinal tumor: a case report. Nagoya J Med Sci. 2014;76(1–2):195.
11. Marzahl C, Aubreville M, Bertram CA, Stayt J, Jasensky AK, Bartenschlager F, et al. Deep learning-based quantification of pulmonary hemosiderophages in cytology slides. Sci Rep. 2020;10(1):1–10.

E-ISSN: 2614-5219

12. McBride W, Brock D. Intracranial epidural hematoma in adults. UpToDate Ver. 2016;19.
13. Aromatario M, Torsello A, D'Errico S, Bertozzi G, Sessa F, Cipolloni L, et al. Traumatic epidural and subdural hematoma: epidemiology, outcome, and dating. Medicina (Mex). 2021;57(2):125.
14. Marzahl C, Aubreville M, Bertram CA, Stayt J, Jasensky AK, Bartenschlager F, et al. Deep learning-based quantification of pulmonary hemosiderophages in cytology slides. Sci Rep. 2020;10(1):1–10.